

WESTERN ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM (W-EMAP) UPDATE WINTER 2003

www.epa.gov/r10earth/emap.htm

INTRODUCTION

EPA's Environmental Monitoring and Assessment Program (EMAP) is designed to provide tools to monitor and assess the condition of the nation's freshwater and coastal systems. Western EMAP focuses on the aquatic systems and landscape features of the states encompassed by EPA Regions 8, 9 and 10. There are three major components of the Program - Coastal, Surface Waters (rivers and streams), and Landscapes. Another important feature of Western EMAP is the partnership between EPA and the States. All field data for Western EMAP in EPA Region 10 is or will be collected by the state and tribal environmental agencies.

EMAP was developed by EPA's office of Research and Development (ORD) to monitor status and trends in the condition of the nation's ecological resources at regional and national scales. Western EMAP represents a five-year effort by the EPA to advance the science of ecosystem health monitoring and to demonstrate the application of core EMAP indicators in environmental assessment. This update describes progress to date and future activities.

COASTAL

The coastal component of Western EMAP applies EMAP's monitoring and assessment tools to create an integrated and comprehensive coastal monitoring program along the west coast. Water column measurements are combined with information about sediment characteristics and chemistry, benthic organisms, and data from fish trawls to describe the current estuarine condition.

Sampling has focused on a different component of the estuarine resource each year. The Washington Department of Ecology (Ecology) and the Oregon Department of Environmental Quality (ODEQ) completed sampling of small estuaries in 1999.

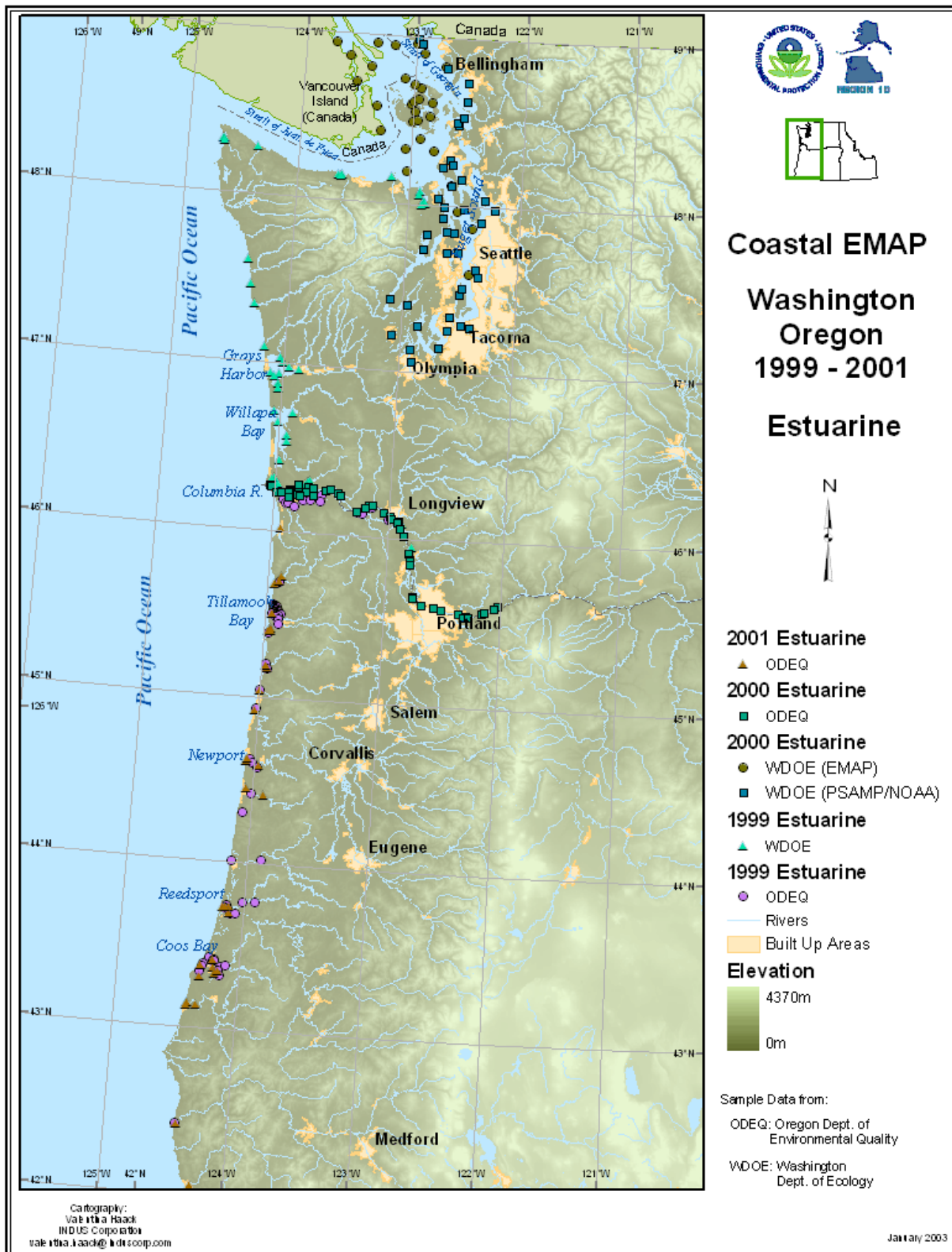
Oregon sampled a second set of small systems in 2001. Sampling of larger systems (Puget Sound, Columbia River Estuary) was completed in 2000. An intensified study of Tillamook Bay, Oregon, that was integrated into the overall design was also conducted in 1999. The data from 1999 are complete and reporting is underway. Data analysis and reporting for samples collected in 2000 will follow shortly. See Map 1 for estuarine sample site locations for 1999-2001.



PHOTO: Ocean Cape, the vessel used to sample in Alaska, at the dock in Seward in 2002.

Part of the coastline of Alaska was sampled in 2002. The Alaska Department of Environmental Conservation (ADEC) managed this effort with support from the Cook Inlet Regional Citizens Advisory Council (CIRCAC). Due to the exceptionally long coastline, the sampling for Alaska focused on the south central coast (called the Alaskan Biographic Province), which includes both Cook Inlet and Prince William Sound. Samples were collected from 55 sites to support a Province-wide assessment of condition.

In Oregon and Washington, sampling in 2002 focused on the intertidal zone, including low salt marsh, intertidal flats and shallow subtidal



Map #1 – Western EMAP Estuarine sampling sites in Oregon and Washington, 1999-2001

habitats of estuaries. Aquatic vegetation communities were added to the list of information collected at each location.



PHOTO: Oregon DEQ sampling salt marsh habitat at Sand Lake in 2002

In 2003, Coastal EMAP will move offshore to sample the continental shelf habitat down to a depth of 120 m. NOAA has donated ship time on the *R/V Indomitable* to serve as a sampling platform for this effort. In April, approximately 50 samples will be collected offshore of each of the states of Washington, Oregon and California. In Washington, an intensified study within the Olympic Coast National Marine Sanctuary will be integrated into the overall design.

SURFACE WATERS – (Rivers and Streams)

Western EMAP applies tools developed by ORD to monitor and assess rivers and streams across the contiguous western States. Water chemistry, physical habitat, benthic macroinvertebrate, fish, and periphyton assemblage data are combined to describe the current river and stream conditions. Idaho Department of Environmental Quality (IDEQ), Oregon DEQ, Ecology, and the Nez Perce Tribe have conducted the vast majority of sampling for Western EMAP in Region 10.

The Western EMAP surface water component is designed to evaluate the ecological condition of rivers and streams at two scales. The broad scale

assessment will allow us to evaluate the overall condition of rivers and streams for each state and the entire region (See Map 2). For this scale assessment, approximately 150 stream sites are in the process of being sampled in Idaho, Oregon and Washington over a 4 to 5 year period, beginning in 2000 (See table 1). Over the same time period, approximately 50 river sites will also be sampled across these three states.

Table 1. Status of sampling sites for statewide WEMAP as of Fall 2002

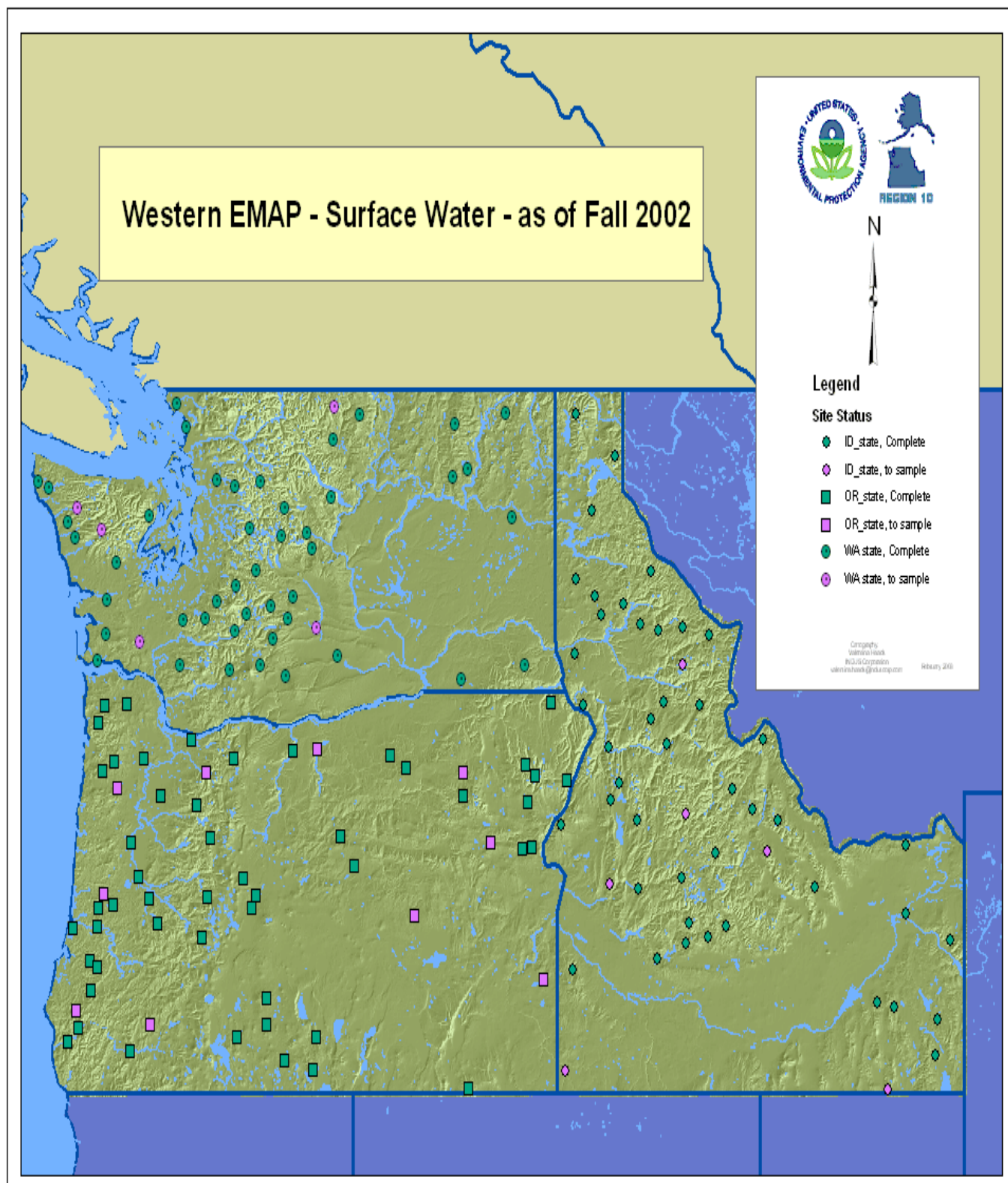
State	Completed	Remaining	Target
ID	44	6	50
OR	50	10	60
WA	45	5	50
TOTAL	139	21	160

The second scale of evaluation is smaller and more localized. This smaller scale will allow us to more intensively assess particular geographic areas or resource types. These areas will be sampled over the same four year period as the broad scale sample sites. For streams, we will be intensifying the EMAP sampling effort in four areas: the Deschutes and John Day basins of



PHOTO: Washington Department of Ecology sampling the Chiwawa River, 2002

Oregon, the Wenatchee Basin of Washington, the Nez Perce reservation of the Nez Perce tribe in Idaho and the medium to large sized rivers of Idaho. Table 2 shows the progress that has been made in sampling of the four focus areas. The



Map #2 – Western EMAP Statewide Surface Waters sampling sites in EPA Region 10

sampling of the Deschutes and John Day and Wenatchee basins began in 2000. The river sampling in Idaho and the stream sampling on the Nez Perce reservation began in 2002.

Table 2. Status of sampling sites for Focus Areas as of Fall 2002

Focus Area	Completed	Remaining	Target
Idaho Rivers	16	29	45
Nez Perce Reservation	8	67	75
Deschutes/John Day Basin, OR	86	10	96
Wenatchee Basin, WA	37	17	54
TOTAL	147	123	270

LANDSCAPE

Landscape conditions will be assessed using a variety of metrics generated from spatial data. These data have been derived from existing data sources, satellite imagery, and field sampling. They will be combined in a Geographic Information System (GIS) to generate interpretations and assessments for both the coastal and surface water components of Western EMAP. Landscape data will provide environmental managers additional data to identify areas where aquatic resource conditions appear vulnerable to impairment as well as identifying potential areas for resource protection. During 2002 and in 2003, the Landscapes team is developing a series of databases to be used in conjunction with coastal and inland aquatic resources. Much of this database work is now complete and these data are now being used to develop associations between measures of landscape attributes and measures of aquatic condition. An example of these associations is an attempt to identify areas of potential rangeland grazing impacts to aquatic resources.

In 2002 a full suite of datasets and preliminary landscape analysis for the Western EMAP landscape pilot area in Northwest Oregon was completed. These data and analyses are available

on CD and will soon be available via an interactive web browser-based tool. Much of the landscape data is also available for the entire state of Oregon. As the data sets are completed for Idaho, Oregon, and Washington, landscape metrics will be calculated for the various landscape components. A core set of metrics will eventually be developed for each state. In addition, other targeted regions within the Pacific Northwest will have more specific analyses conducted. The goal is to have all the data and analyses produced by the landscape team available via interactive web browser-based tools.

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